Host ecology determines the dispersal patterns of a plant virus

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Supplementary Information

Supplementary Tables

Table 1: Log marginal likelihoods for molecular clock models

Molecular clock model	PS1	PS2	SS1	SS2
Exponential uncorrelated relaxed	-11685.20	-11694.13	-11694.25	-11697.49
Lognormal uncorrelated relaxed	-11667.00	-11670.96	-11669.92	-11669.32
Strict	-11683.93	-11679.56	-11692.06	-11681.71

PS: Path sampling
SS: Stepping-stone sampling

Table 2: Log marginal likelihoods for discrete scenarios

Discrete diffusion model	PS1	PS2	SS1	SS2
Reversible	-306.87	-306.87	-306.44	-306.44
Reversible with BSSVS	-299.10	-299.17	-298.63	-298.71
Non-reversible	-309.08	-309.24	-308.65	-308.81
Non-reversible with BSSVS	-300.43	-300.226	-299.92	-299.70

PS: Path sampling
SS: Stepping-stone sampling

Table 3: **Root location estimates for downsampled datasets for all discrete model scenarios**

Subsampling method	Discrete diffusion model	Modal root location	Posterior probability
By diversity	Reversible	Tanzania	0.64
	Reversible with BSSVS	Tanzania	0.50
	Non-reversible	Tanzania	0.63
	Non-reversible with BSSVS	Tanzania	0.40
Randomly	Reversible	Tanzania	0.57
	Reversible with BSSVS	Tanzania	0.40
	Non-reversible	Tanzania	0.55
	Non-reversible with BSSVS	Tanzania	0.73

Table 4: GLM diffusion results for full data excluding resistance on harvested rice area as a potential predictor

Predictors	Bayes Factor	Log Conditional Effect Size
Distance	> 9000	-1.082 [-1.450 - -0.76]
Origin of rice intensity in 1960	1.08	-1.74 [-3.26 - -0.49]
Destination of rice intensity in 1960	0.011	0.02 [-0.64 - 0.95]
Origin of rice intensity in 1990	7.21	2.51 [0.64 - 5.60]
Destination of rice intensity in 1990	0.048	-0.45 [-1.01 - 0.015]
Origin of precipitation	0.12	0.13 [-1.63 - 3.014]
Destination of precipitation	0.01	-0.12 [-0.48 - 0.16]
Origin of sample size	0.96	0.74 [0.23 - 2.47]
Destination os sample size	1.15	0.62 [0.26 - 1.03]

Values in between brackets represent 95% HPD intervals

Table 5: Log marginal likelihoods for distributions of continuous models

Model	PS1	PS2	SS1	SS2
Cauchy	-13283.67	-13267.39	-13251.18	-13236.09
Gamma	-13271.27	-13252.90	-13229.59	-13214.61
Lognormal	-13208.37	-13189.52	-13206.64	-13187.21
Homogeneous	-13494.189	-13457.77	-13448.06	-13427.39

PS: Path sampling
SS: Stepping-stone sampling
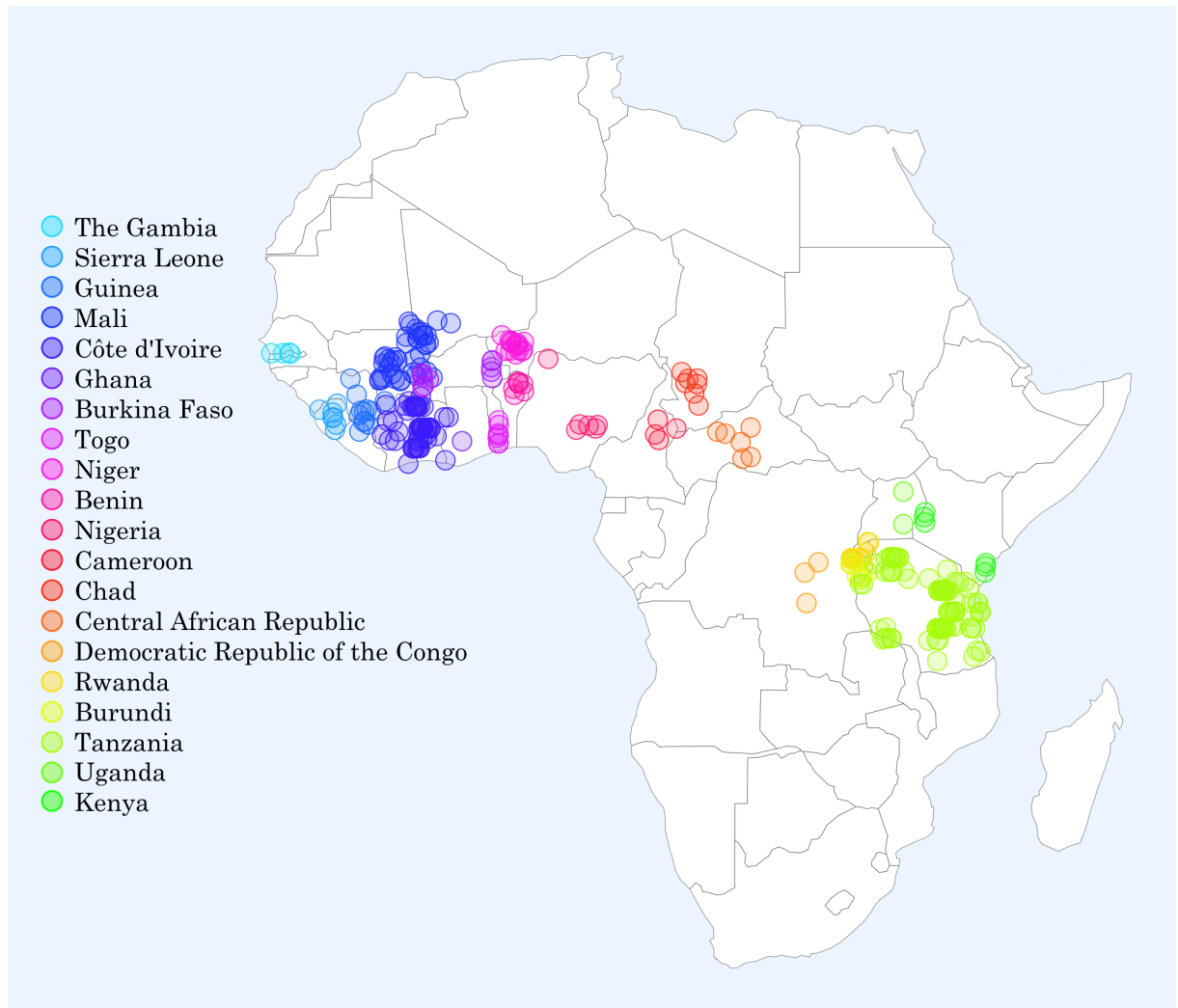
Supplementary Figures

Figure 1: Continuous sampling of RYMV across Africa and respective legend representing the discrete locations assigned.
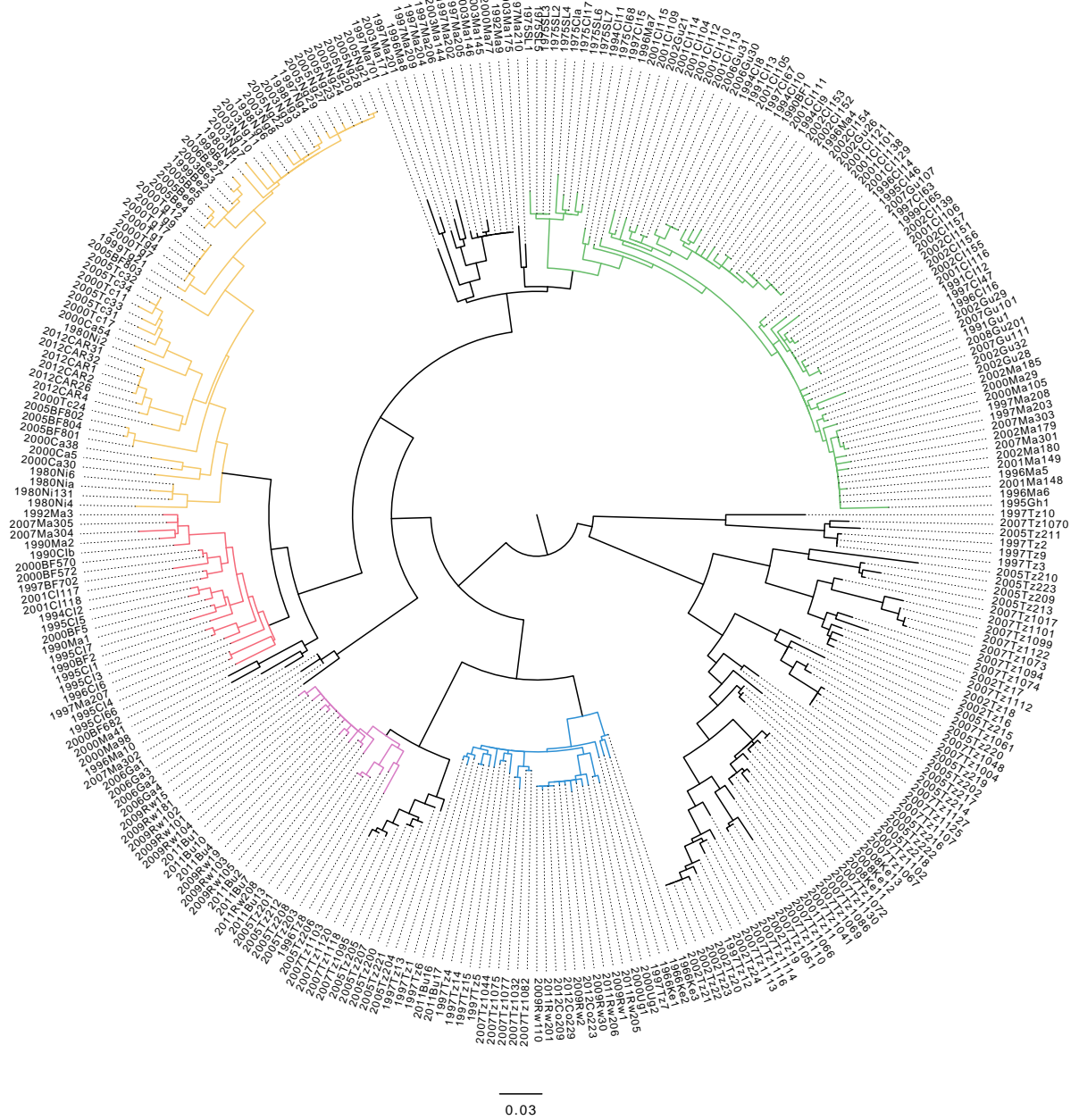
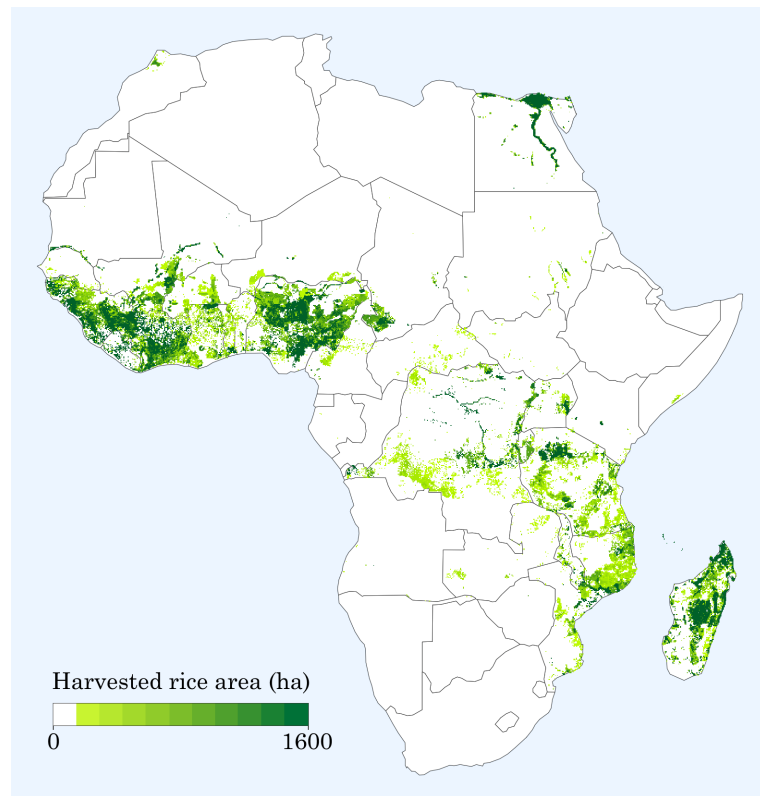Figure 2: Maximum likelihood tree with selected clusters for visual temporal exploration.

Figure 3: Harvested area (hectares) of rice in Africa in 2000, retrieved and adapted from HarvestChoice [1].

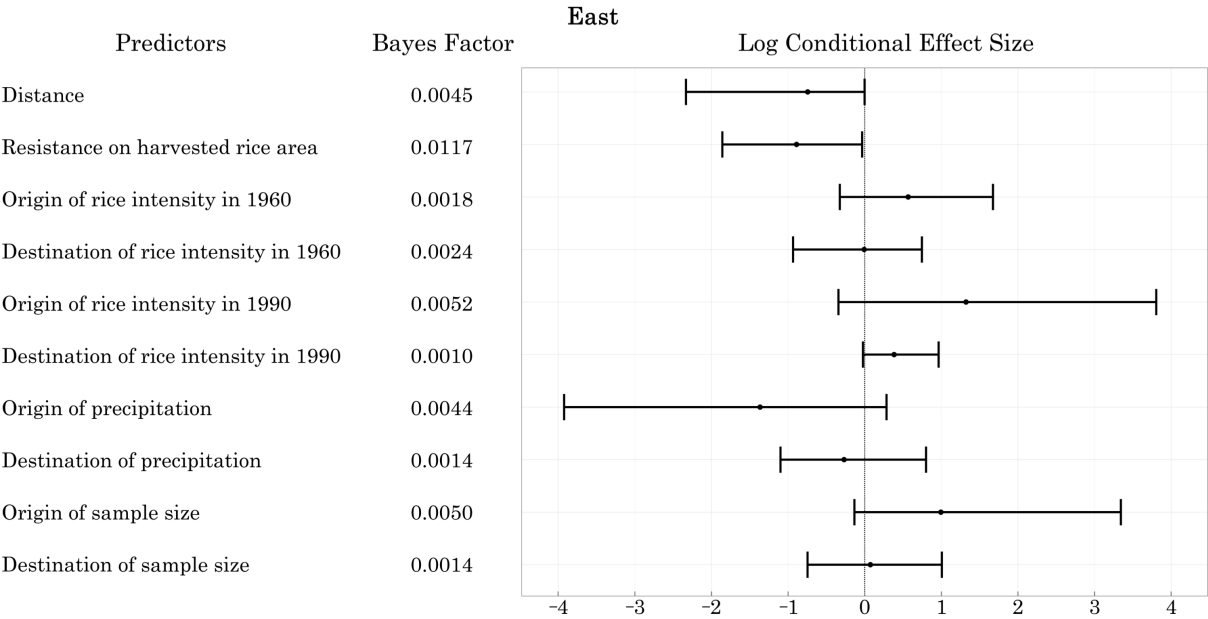| Predictors	Bayes Factor	East Log Conditional Effect Size
Distance	0.0045	
Resistance on harvested rice area	0.0117	
Origin of rice intensity in 1960	0.0018	
Destination of rice intensity in 1960	0.0024	
Origin of rice intensity in 1990	0.0052	
Destination of rice intensity in 1990	0.0010	
Origin of precipitation	0.0044	
Destination of precipitation	0.0014	
Origin of sample size	0.0050	
Destination of sample size	0.0014	

Figure 4: Predictors of RYMV dispersal sampled in East Africa. For each potential predictor, the Bayes factor (BF) support and the conditional effect sizes (cESs) obtained using the GLM diffusion approach implemented in BEAST are shown (posterior mean and 95% Bayesian credible interval, BCI).

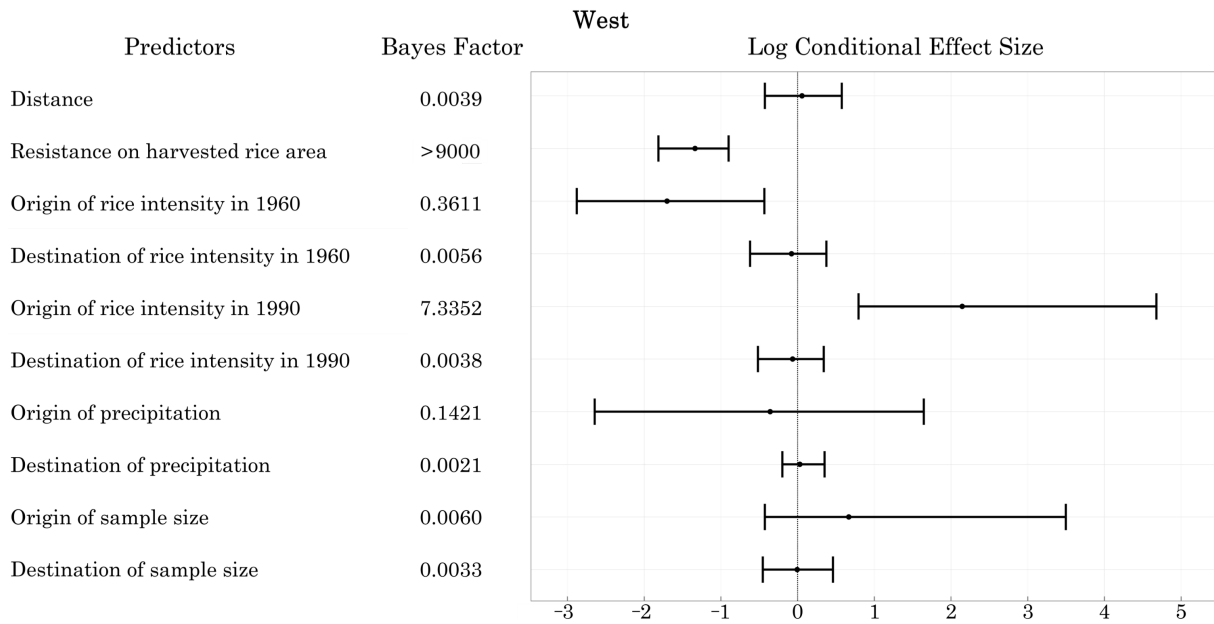| Predictors	Bayes Factor
Distance	0.0039
Resistance on harvested rice area	>9000
Origin of rice intensity in 1960	0.3611
Destination of rice intensity in 1960	0.0056
Origin of rice intensity in 1990	7.3352
Destination of rice intensity in 1990	0.0038
Origin of precipitation	0.1421
Destination of precipitation	0.0021
Origin of sample size	0.0060
Destination of sample size	0.0033

Figure 5: Predictors of RYMV dispersal sampled in West Africa. For each potential predictor, the Bayes factor (BF) support and the conditional effect sizes (cESs) obtained using the GLM diffusion approach implemented in BEAST are shown (posterior mean and 95% Bayesian credible interval, BCI). Note that the credible intervals for the cES of the predictors with BF>7 exclude zero, which can be considered as an additional indication for its importance.

References

[1] HarvestedChoice. Rice area harvested (ha) (2000). International Food Policy Research Institute, Washington, DC, and University of Minnesota, St Paul, MN Available online at http://harvestchoiceorg/node/4799. 2011;.